

Modern Concepts of Cardiovascular Disease

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THE TREATMENT OF RHEUMATIC FEVER*

PART I

This summary of the treatment of rheumatic fever is a brief digest of the experiences of the physicians at the Navy Rheumatic Fever Unit at Corona, California. The care of a large number of patients with rheumatic fever has afforded an opportunity to evaluate many forms of treatment. We trust this summary will prove helpful and at the same time lend a conservative note to the chorus of enthusiasm which is recently manifest.

The essential problem in the treatment of rheumatic fever is to prevent disabling heart disease. If the fulminating polycyclic type could be attenuated and shortened, and if the monocyclic and subclinical types could be prevented from causing severe inflammatory-like reactions in the vascular tissues, then disabling heart disease could be avoided. It is believed that angitis may continue indefinitely after its initiation by an antigen-producing organism in the throat. Since there is, as yet, no effective method of destroying the antigen-producing bacterial agent, nor of suppressing the destructive reactions in the terminal arterioles of the vascular tree, there must be an alignment of all the available therapeutic agents to prevent death or at least to reduce the cardiac damage to the minimum.

The treatment of the rheumatic state is divided loosely into two parts according to the stage of the disease—the stage of activity and the stage of quiescence.

The stage of activity: The point at which the physician should start treatment of the active rheumatic state is difficult to determine. Every patient with an acute hemolytic streptococcal sore throat is a potential rheumatic fever subject, especially if he comes from a family with a rheumatic background, or if he has had a previous attack of rheumatic fever. The patient with a hemolytic streptococcal infection of the throat should be observed over a longer period of time than that usually practiced, to detect the onset of an active rheumatic state at the earliest possible moment. The patient who is slow in recovering from the acute hemolytic streptococcal throat infection and who fatigues easily, has a slight evening fever, has an elevated sedimentation rate and a high antistreptolysin titre is very likely to develop rheumatic fever. With the onset of the active stage of rheumatic fever early recognition is requisite and the patient should be placed immediately

on a carefully planned and administered regime.

Rest: Absolute bed rest is imperative and must be continued in varying degrees until the signs of activity have disappeared. Rest means limited activity in bed, quiet surroundings conducive to sleep, and diversionary facilities. As the patient improves, rest must be judiciously proportioned to the state of the disease.

Nursing care: Nursing care wisely and intelligently carried out does much to promote rest, sleep, and mental diversion. A daily bath with tepid water, clean linen, attention to diet and to elimination are elementary but essential nursing services.

Diet: The diet should be highly nutritious, of at least 3,500 calories per day, given in liquid to soft or solid form dependent upon the patient's temperature and general condition.

Salicylates: Salicylate is the only drug which has survived the test of time in the treatment of rheumatic fever. Most clinicians agree that the salicylates have an analgesic and antipyretic action in rheumatic fever. Few, however, feel that salicylates modify the progress of the disease process. Salicylates do relieve pain, lower the temperature, and hasten the absorption of the transudate in the serous cavities during the first attack, but they have no effect on the disease process. Furthermore, the salicylates have little if any analgesic and antipyretic effect in the second and third cycles, and in the course of the prolonged monocyclic cases. Salicylates in our studies do not prevent recurrences, as shown by studies soon to be published.

Salicylates in the form of sodium salicylate gr. XXV and sodium bicarbonate gr. X every 4 hours, or aspirin gr. XX and sodium bicarbonate gr. XX every 4 hours, day and night with 3,000 c.c. of water, elevate the blood salicylates to the optimum level of 30 to 50 mg. per 100 c.c. of blood within 24 to 48 hours. If the salicylates are administered absolutely regularly with an adequate quantity of water, the blood level remains at or near the optimum. Another study carried on in this unit shows that salicylates are promptly absorbed from the upper gastrointestinal tract and appear in the blood within 15 to 30 minutes, and that the optimum level can be maintained with the aforementioned dosage. The excretion of the drug is rapid through the kidneys so that within 24 hours after the cessation of the salicylates very little trace, if any, can be found in the blood. The drug may be administered in the

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form of the sodium or acetyl salts without alteration of the optimal blood level. The drug should never be given in the enteric-coated tablets, as it is absorbed from the upper gastro-intestinal tract and if the enteric-coated tablets are slow in disintegrating in the colon, a toxic dose may suddenly be absorbed from the accumulated tablets resting there.

The salicylates are unpleasant to take orally and may induce tinnitus aurium, burning of the eyes, sweating, cerebral excitement, irritability, and irresponsibility, as well as gastric irritation. However, in the above mentioned dosage such symptoms are rare. If the patient is ambulatory and develops signs and symptoms of salicylism, the return to rest promptly affords relief. Gastric irritation is readily avoided by the ingestion of abundance of water and food with the drug. The only reason for the administration of bicarbonate with the salicylates is to prevent gastric irritation. Upon ingestion, the hydrochloric acid of the stomach changes the sodium and acetyl salts to salicylic acid. In our experience, the use of somewhat smaller doses of sodium bicarbonate than those reported by Smull et al (1944) did not lower the blood salicylate level. Proof of this will be submitted in a subsequent paper.

The intravenous administration of the drug is undesirable and unnecessary except in those very rare instances where salicylates cannot be given orally. When the salicylates are swallowed according to the aforementioned dosage, the level is consistently maintained. If the level is low, the patient is not receiving the drug regularly; if the level is too high, there has been an insufficient fluid intake. The administration of 1,000 c.c. of 1 per cent sodium salicylate intravenously over a period of 6 to 10 hours not only tires the patient but may throw an added strain on the right heart. The administration of 10 c.c. of a 10 per cent solution intravenously raises the level adequately, does no harm when given at the rate of 1 c.c. per minute through a 26 gauge needle, but may sclerose the veins making frequent administration difficult. In congestive failure there is slow absorption of the drug. Our experience has been that salicylates do not benefit the patient materially in congestive failure. Salicylates per rectum are very poorly absorbed. A subsequent paper in the series from this Unit shows that no appreciable amount of the drug reaches the blood stream when administered per rectum. Therefore, we believe oral administration is the method of choice.

Digitalis: In our experience, digitalis is of doubtful value in the active stage of the disease. Its use is indicated only with the onset of congestive failure during the course of an active carditis. The drug is administered in full dosage orally. The method calls for one U.S.P. unit per 10 lbs. of body weight, adding one unit (gr. $1\frac{1}{2}$) for each additional day required to complete digitalization, and thereafter maintained by 1 U.S.P. unit (gr. $1\frac{1}{2}$) daily. It has not been necessary to use digitalis or quinidine in the treatment of the very rare instances of paroxysmal auricular fibrillation and the more rare paroxysmal tachycardias, as these subside spontaneously with rest. Congestive failure has occurred rarely in the quiescent stage of the disease, and therefore digitalis has been used infrequently. Quinidine is seldom used because of the infrequent occurrence of the paroxysmal tachycardias. Premature contractions occurring in the acute phase of the disease are not

eliminated by the use of a daily ration of quinidine. Rest and the avoidance of cigarettes are of distinct value. Quinidine and paredrine hydrobromide have not been useful in the correction of arrhythmias during the stage of carditis.

Oxygen: Oxygen is of great value in the treatment of rheumatic pneumonitis and congestive failure. Restlessness, cyanosis, dyspnea, and even tachycardia are relieved by the administration of oxygen. Oxygen is given early and as long as the patient requires its help. It is easily administered by the nasal tube method passing approximately 4 liters of oxygen per minute thru a humidifier and into the nasopharynx. By this method the coldness of the oxygen tent is avoided, the patient is less annoyed and feeding and nursing care are rendered with greater ease. The saving in the amount of oxygen used is at least one half.

Diuretics: Diuretics are used only when there is evidence of congestive heart failure. The diuretics are believed to be of greater value than any other drug in the treatment of congestive failure in acute carditis. It has been observed here that right-sided failure is frequently primary. It is believed that this is due to the associated rheumatic pneumonitis which decreases the vascular pulmonary tree to such an extent that the blood pressure in the lesser circulation is elevated and throws a marked strain on the right ventricle. The diuretics in the form of theobromine sodium acetate in dosage of $7\frac{1}{2}$ grains or aminophyllin gr. III q.i.d. are effective. If the engorged liver and the peripheral edema persist when absolute bed rest, digitalis, and the xanthine diuretics have been used, then mercupurin or salyrgan intravenously have been found helpful. In acute carditis, the mercurial diuretics may produce an anuria and therefore must not be used if there is evidence of renal impairment or inflammation.

Sulfa Drugs: The sulfa drugs have been used in a large number of patients with rheumatic fever because of the apparent relationship between the streptococcal throat infection and the acute rheumatic state. No sulfa drug has been used for the treatment of rheumatic fever, *per se*, in the Rheumatic Fever Unit. A review of 240 unselected case records shows that a total of 46 patients had been treated at the onset of the rheumatic fever with various forms of sulfonamides, chiefly sulfadiazine. Of these 46 patients a good response was reported in 4, no response in 20, condition worse in 11, and no comment in 11 cases. Rheumatic fever patients with intercurrent tonsillitis, sinusitis, or otitis media with positive hemolytic streptococcal cultures have been treated with a full dosage of sulfadiazine. The salicylates were continued at the same time. Recrudescence of the rheumatic activity has been very rare. In cases so treated, only three cases of reactivation occurred. Investigations by Coburn, 1938, Swift, Moen and Hirst, 1938, have shown that the drug is useless in the treatment of rheumatic fever, and from the above review of the 46 cases treated this opinion is confirmed. Therefore, the use of sulfa drugs in the treatment of rheumatic fever should be condemned.

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